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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

KB-4400

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)

10/030957

INTERNATIONAL APPLICATION NO.

PCT/US00/18588

INTERNATIONAL FILING DATE

7 JULY 2000 (07.07.00)

PRIORITY DATE CLAIMED

8 JULY 1999 (08.07.99)

TITLE OF INVENTION

PROTECTIVE WAISTCOAT

APPLICANT(S) FOR DO/EO/US

DAKO, Kwame

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to being national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b)) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application was filed (35 U.S.C. 371 (c) (2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau.
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US)
6. ☐ A translation of the International Application into English (35 U.S.C. 371 (c) (2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c) (3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☒ A copy of the International Preliminary Examination Report (PCT/IPEA/409)
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 18 below concern document(s) or information included :

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
A **SECOND** or **SUBSEQUENT** preliminary amendment.
16. ☐ A substitute specification.
17. ☒ A change of power of attorney and/or address letter.
18. ☒ Certificate of Mailing by Express Mail.
19. ☒ Other items or information:

17. General Power of Attorney

18. Express Mailing Label No.: EJ376014215US

19. Form PCT/IB/306

APPLICATION NO. (IF KNOWN, SEE 37 CFR) 10/030957		INTERNATIONAL APPLICATION NO. PCT/US00/18588		ATTORNEY'S DOCKET NUMBER KB-4400	
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20. The following fees are submitted

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

☒ Search Report has been prepared by the EPO or JPO \$890.00

☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) \$710.00

☐ No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.445(a)(2)) \$740.00

☐ Neither international preliminary examination fee paid to USPTO (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO \$1,040.00

☐ International preliminary examination fee paid to USPTO (37 CFR 1.482) And all claims satisfied provisions of PCT Article 33(2)-(4) \$ 100.00

ENTER APPROPRIATE BASIC FEE AMOUNT =

Surcharge of **\$130.00** for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492 (e)). ☐ 20 ☒ 30

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE
Total Claims	27 - 20 =	7 x	\$18.00
Independent Claims	1 - 3 =	7 x	\$84.00
Multiple Dependent Claims (check if applicable)			<input checked="" type="checkbox"/> \$280.00
TOTAL OF ABOVE CALCULATIONS =			\$406.00
Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) (check if applicable).			<input type="checkbox"/> \$0.00
SUBTOTAL =			\$406.00
Processing Fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492 (f)). <input type="checkbox"/> 20 <input type="checkbox"/> 30			\$0.00
TOTAL NATIONAL FEE =			\$1,426.00
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) (check if applicable).			<input type="checkbox"/> \$0.00
TOTAL FEES ENCLOSED =			\$1,426.00
			Amount to be refunded \$
			Charged \$

CALCULATIONS PTO USE ONLY

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☐ A check in the amount of _____ to cover the above fees enclosed.

☒ Please charge my Deposit Account No. **04-1928** in the amount of **\$1,426.00** to cover the above fees.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **04-1928** a duplicate copy of this sheet is enclosed.

NOTE : Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (CFR 1.37(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

GRIFFITHS, John E.
E. I. DU PONT DE NEMOURS AND COMPANY
Legal Patent Records Center
1007 Market Street
Wilmington, Delaware 19898
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SIGNATURE *John E. Griffiths*

NAME **GRIFFITHS, JOHN E.**

REGISTRATION NUMBER **32,872**

DATE *January 3, 2002*

TITLE OF THE INVENTIONPROTECTIVE WAISTCOATBACKGROUND OF THE INVENTION

5 Field of the Invention.

The invention relates to a protective waistcoat which comprises a front section on the front side of a person wearing the waistcoat and a back section on the back side of said person, straps for connecting the two sections, and a number of armour
10 cover parts forming the sections.

Personnel within, for example, the police and the army and also, for example, body guards and doormen can, in certain circumstances find themselves in dangerous situations where
15 they risk being attacked by small arms such as revolvers and small machine guns or by pointed objects such as knives or awls.

When a person in such a situation is wearing a protective
20 waistcoat, the person will, to a great extent, be secured against injury or even death by the attack.

Description of the Prior Art.

Protective waistcoats have normally been made of materials that
25 are resistant to penetration by projectiles fired from small arms. Some waistcoats have also been made of materials that are resistant to penetration by both a projectile and a pointed object such as a knife or an awl.

30 The material has conventionally been formed as plates that have been rather stiff and heavy to provide the person wearing the waistcoat the desired degree of protection.

While the known protective waistcoats made of such stiff and
35 heavy armour plates could offer the wearer the desired degree of protection against attacks of the above named type, the

problem of comfort and the impediments to mobility have been compromised.

US 5,060,314 discloses a protective waistcoat comprising left and right combined front and side panels which are secured together by fastening means. US 5,903,920 discloses a protective waistcoat made of various layers of woven fibres incorporating a net which is flexibly fixed relative to said layers.

SUMMARY OF THE INVENTION

The protective waistcoat of this invention, includes a front section and a back section wherein the front section comprises at least one upper plate-formed armour cover part for substantially covering the chest region of a person wearing the waistcoat, at least one lower plate-formed armour cover part for substantially covering the abdominal region of the person, and at least some of said armour cover parts are arranged in partly overlapping relationship to each other.

It is important that the various cover parts are arranged to partly overlap adjacent armour cover parts such that there are no openings that would allow a bullet or a knife or awl to pass through and hit the body of a wearer of the waistcoat.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 shows, seen from the front, a first embodiment of the waistcoat according to the invention,

Fig. 2 shows the same, seen from behind,

Fig. 3 is a front view of a person wearing a second embodiment of a waistcoat according to the invention,

Fig. 4 shows the same, seen from the side,

Fig. 5 shows the same, seen from behind,

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Fig. 6 shows, on an enlarged scale, the second embodiment of the waistcoat, seen from the front,

5 Fig. 7 shows the same, seen from behind,

This design, including overlap of adjacent cover parts, provides a person wearing the waistcoat with a high degree of comfort and mobility in addition to a high degree of protection against being shot and/or stabbed.

Each armour cover part should comprise a fabric forming an enclosure, which is filled with a protective material; and the protective material should be resistant against penetration by low calibre projectiles fired from small arms. A suitable protective material for this purpose is para-aramid fiber such as that sold by E. I. du Pont de Nemours and Company under the trademark KEVLAR®. Such material exists typically in relatively thin layers of fabric, either woven or not, which are sewn or laid together to obtain the needed thickness.

Bullet-resistant materials are, however, often not sufficiently resistant against penetration by a pointed object like a knife or an awl. Between two layers of bullet-resistant materials, a second protective material can be placed, that is resistant to penetration by a knife or an awl. Such a material could be a plate of polycarbonate.

In a first and very simple embodiment of this invention the at least one upper plate-formed armour cover part for substantially covering the chest region of a person wearing the waistcoat comprises one upper plate-formed right hand armour cover part for substantially covering the right-hand chest region of a person wearing the waistcoat and at least one upper plate-formed left hand armour cover part for substantially covering the left-hand chest region of the person.

The right-hand - and left-hand upper armour cover parts can have a zipper or a similar device for assembling said parts in overlapping relationship to each other whereby the waistcoat is extremely easy to put on. Furthermore, the zipper ensures the maintenance of the required protective overlapping relationship. The waistcoat can be taken off in the same very easy manner.

To ensure that no part of the side of a wearer's torso is unprotected, the armour cover part of the back section can comprise at least one armour cover part arranged in partly

overlapping relationship to the at least one lower plate-formed armour cover part of the front section when the waistcoat is positioned on the wearer.

- 5 Alternatively, the armour cover parts of the back section can comprise an elongated central armour cover part extending along the spinal column of a person wearing the waistcoat, and at least two plate-formed side armour cover parts attached at each side of the central armour cover part in partly overlapping
10 relationship to this and to each other.

This construction is built up in a similar way as the skeleton of the human body, whereby the spinal column corresponds to the elongated central armour cover part and the ribs to the side
15 armour cover parts. The waistcoat will, therefore, act in the same way as the skeleton by adapting to the movements of this, thereby offering a person wearing the waistcoat a high degree of comfort and mobility.

- 20 As for the first embodiment it is important to emphasize that the cover parts always are partly overlapping adjacent cover parts such that no openings can be found that allow a bullet or a knife or awl to pass and hit the body of the wearer.

- 25 The central armour cover part can have two armour cover webs at each side of the central armour cover part for partly overlapping the respective plate-formed side armour cover parts, that can be connected to the central armour cover part by means of connection webs; that, at each side of the central
30 armour cover part, are placed between the two armour cover webs on the same side of the central armour cover part as the respective connection webs.

- 35 Movements of the skeleton of a wearer takes place by means of motor muscles, that, at their ends, are attached to the skeleton. The armour cover plates are, according to the invention, located such that they advantageously co-operate

with the different groups of muscles by following their movement.

In a second embodiment of this invention, the armour cover plates can be arranged such that there are, at each side of the central armour cover part, an upper plate-formed side armour cover part for substantially covering the scapula region of a person wearing the waistcoat and a lower plate-formed side armour cover part for substantially covering the lower region of the back of the person; and that, at the front side of the person, there can be placed two upper plate-formed armour cover parts for substantially covering the chest region, and at least one lower-plate formed armour cover part for substantially covering the abdominal region of the person.

The various armour cover parts can be, according to the invention, connected with connecting means such as straps allowing the armour cover parts to move in relation to each other in such a way that the cover parts follow movements of the skeleton and the musculature of the person wearing the waistcoat.

For that purpose, the connecting means for interconnecting the front section and the back section, can have a first set of straps extending over the shoulders of a person wearing the waistcoat and connecting the upper plate-formed side armour cover parts for substantially covering the scapula region of the person and the at least one upper plate-formed armour cover part for substantially covering the chest region of the person.

Furthermore, that first set of straps can be connected to the upper end of the elongated central armour cover part extending along the spinal column of a person wearing the waistcoat by means of a second set of straps, and the lower end of the central armour cover part can be connected to the at least one upper plate-formed armour cover part for substantially covering

the chest region of the person by means of a third set of straps.

At least some of the straps can be made of an elastic material, to improve the possibility and ability of the armour cover parts to move in relation to each other and to follow the movements of the skeleton and the musculature of the person wearing the waistcoat.

As a matter of the design for the waistcoat of this invention, the weight of the waistcoat is distributed over the entire torso of the wearer. Consequently, the waistcoat does not feel heavy to wear.

Also, due to the specific construction of the waistcoat, it is very simple to adapt the waistcoat to different persons having different torso sizes and waist measurements.

Each armour cover part constitutes a releasable independent unit. Therefore, individual armour cover parts can be simply removed from the waistcoat and replaced by a new intact armour cover part. Furthermore, armour cover parts for any individual need can easily be manufactured. For example, it can be mentioned that the upper plate-formed armour cover part can be designed to perfectly fit a woman.

The invention will be explained more fully by the following description of an embodiment, which just serves as an example, with reference to the drawings.

30

Fig. 1 is, seen from the front, a first embodiment of a waistcoat according to the invention. Fig. 2 shows this embodiment from behind. Waistcoat 2 consists of a front section 3 and a back section 4. The two sections 3 and 4 are arranged to partly overlap each other along the side of the person wearing the waistcoat thereby carefully protecting also this part of the person. Shoulder straps 5a, 5b, extending over

the shoulders of the person, are connecting means for connecting the two sections 3 and 4.

5 The waistcoat 2 shown in Figs. 1 and 2 is a four-unit waistcoat in which section 4 is one single armour cover part 8 and section 3 is built up of three armour cover parts 16a,16b,18 in partly overlapping relationship. The upper plate-formed armour cover parts 16a,16b are detachably assembled in partly overlapping relationship to each other by means 19 which, in 10 the shown case, is a zipper 19.

Two straps 14a,b are attached to the top of the armour cover part 8 of the back section 3 for connecting said armour cover part 8 to the upper plate-formed armour cover parts 16a,16b of 15 the front section 3 by means of the shoulder straps 5a,b extending over the shoulders of the person wearing the waistcoat. Buckles 15a,b serve for making the connections adjustable.

20 The two sections 3 and 4 are brought into correct position in relation to the body of the person and to each other by adjusting the shoulder straps 5a,b in relation to the upper cover parts 16a,b. This adjusting can be done easily and quickly because the upper cover parts 16a,b and the shoulder 25 straps 5a,b are supplied with connecting means such as, for example, mating strips of hook and pile fastening known as VELCRO® 24a,b.

The lower cover part 18 is connected to the shoulder straps 30 5a,b by means of straps 20a,b made of an elastic material.

There can, also, be provided one or more straps, for connecting either the lower end of the lower plate-formed armour cover part 18 of front section 3 and/or the lower end of the armour 35 cover part 8 to the belt straps of the trousers (not shown) of the person wearing the waistcoat.

One pair of straps 25a,b, attached to each side of the lower end of the armour cover part 8 of the back section 4, are pulled through a loop 27 on the lower plate-formed armour cover part 18 of the front section 3 and the straps 25a,b are
 5 adjustably tightened in relation to each other by means of a buckle 28.

The lower end of the plate-formed armour cover part 8 of the back section 4 and the lower end of the plate-formed armour
 10 cover part 18 of the front section 3 are partly folded over the side regions of the body of the person wearing the waistcoat in partly overlapping relationship to each other while in the same time said parts are gathered around the body.

15 Two other straps 29a,b can be attached to each side of the lower end of the plate-formed armour cover part 8 of the back section 4 for connecting the upper plate-formed armour cover parts 16a,b of the front section 3 to armour cover part 8. The straps 29a,b are fixed to buckles 23a,b on the upper plate-
 20 formed cover parts 16a,b, said buckles being attached to said cover parts 16a,b by means of straps 22a,b.

During tightening and adjusting of straps 29a,b the lower cover part 8 of the back section 4 and the lower plate-formed cover
 25 part 18 of the front section 3 are caused to gather around the body of the wearer. Adjustment of the fitting of the waistcoat to the person is described in further detail in relation to the second embodiment.

30 However, by a simple individual adjustment of the strap system of the waistcoat, the waistcoat can be made to perfectly fit the torso of a person; and, because the straps are made of an elastic material, the movement of the person will not affect the correct protective placement of the cover parts of the
 35 waistcoat.

The waistcoat according to this second embodiment of the invention consists of a front section 3, as seen in Fig. 3, and a back section 4, as seen in Fig. 5. Fig. 4 shows that the two sections 3 and 4 are partly overlapping each other along the side of the person thereby carefully protecting also this part of the person. Shoulder straps 5a, 5b, extending over the

shoulders of the person, are connecting the two sections 3 and 4.

Figs. 6 and 7 show, on an enlarged scale, solely the waistcoat 2, which, in Fig. 6, is seen from the front and, in Fig. 7, from behind. The two sections 3 and 4 are built up of several armour cover parts, the construction of which will be more fully explained later on.

10 The cover parts of the back section 4 consist of an elongated central cover part 6 extending along the spinal column of the person 1, two upper plate-formed side cover parts 7a,b and two lower plate-formed side cover parts 8a,b.

15 The back section of the waistcoat is in Fig. 8, seen in an exploded view, and the central cover part 6 is, in perspective, shown in Fig. 9.

As best seen in Fig. 9, the central cover part 6 has at each side of a central axis 9, two armour cover webs 10 and two connection webs 11 which are placed between two of said armour cover webs 10.

Each of the upper plate-formed side cover parts 7a,b is assembled with one of the connection webs 11 by means of a zipper 12, and each of the lower plate formed side cover parts 8a,b is assembled with another one of the connection webs by means of a zipper 13.

30 When attached to the connection webs 11, the armour cover webs 10 are partly overlapping the cover parts 7a,b and 8a,b, and these are again partly overlapping each other.

Two straps 14a,b are attached to the top of the two upper side cover parts 7a,b for connecting said parts to the front section by means of shoulder straps 5a,b extending over the shoulders

of the person wearing the waistcoat. Buckles 15a,b serve for making the connections adjustable.

The cover parts of the front section 3 consist of two upper plate-formed cover parts 16a,b and a first 17 and second 18 lower plate-formed cover part. The upper cover parts 16a,b is in this case detachably assembled by means of a zipper 19 in partly overlapping relationship to each other.

10 The first lower cover part 17 is connected to the upper plate-formed cover parts 16a,b in partly overlapping relationship to this by means of straps 20a,b attached to the upper end of the upper cover parts 16a,b. The straps are preferably made of an elastic material such as neoprene.

15

The second lower cover part 18 is connected to the upper plate-formed cover parts 16a,b in partly overlapping relationship to the first lower cover part 17 by means of straps 21a,b attached to the lower end of the upper cover parts 16a,b. The straps 21a,b are preferably made of an elastic material such as neoprene.

20

Furthermore, there can be provided one or more straps, for connecting either the lower end of the first lower plate formed cover part 17 of front section 3 or the lower end of the second lower plate formed cover part 18 of front section 3 to the belt straps of the trousers (not shown) of the person wearing the waistcoat. Optionally a corresponding arrangement can be made in relation to the back section 4.

25

Straps 22a,b having buckles 23a,b attached to the lower end of the upper cover parts 16a,b serve to connect these to the belt straps of the trousers (not shown) of the person wearing the waistcoat.

30

When putting on the waistcoat, the shoulder straps 5a,b, which connect the front and back sections 3 and 4 of the waistcoat 2,

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are laid over the shoulders of the person who is to wear the waistcoat, such that the front section is hanging down the front of the person and the back section is hanging down the back of the person.

5

The two sections 3 and 4 are brought into correct position in relation to the body of the person and to each other by adjusting the shoulder straps 5a,b in relation to the upper cover parts 16a,b. This adjusting can be done easily and quickly because the upper cover parts 16a,b and the shoulder straps 5a,b are supplied with mating strips of hook and pile fastening known as VELCRO® 24a,b.

10

The two sections 3 and 4 are, then, tightened in relation to the body of the person and in relation to each other by means of several straps.

15

Two pair of straps 25a,b, attached to each side of the lower end of the central cover part 6 of the back section 4, are pulled through loops 26a,b on the lower plate-formed side cover parts 8a,b of the back section 4 and through another loop 27 on the second lower plate-formed cover part 18 of the front region 3. Then the two pair of straps 25a,b are tightened in relation to each other by means of buckles 28 on one of the two pair of straps 25a,b. The lower plate-formed side cover part 8a,b of the back section 4 and the second lower plate-formed cover part 18 of the front region 3 are thereby partly folded over the side regions of the body of the person 1 in partly overlapping relationship to each other while, at the same time, said parts are gathered about the body.

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Further, two other straps 29a,b, attached to each side of the lower end of the central cover part 6 of the back section 4, are pulled through loops 30a,b on the lower plate-formed side cover parts 8a,b of the back section 4 and fastened to the lower end of the upper plate-formed cover part 16a,b of the front section 3, thereby gathering the lower plate formed side

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cover parts 8a,b, the first lower plate-formed cover part 17 of the front region 3, and the upper plate-formed cover parts 16a,b of the front section 3 about the body of the wearer.

5 At the same time the first cover part 17 is brought into partly overlapping relationship with the lower plate-formed side cover parts 8a,b of the back section 4 and into the upper plate-formed cover parts 16a,b of the front section 3. The first
10 cover part 17 has also been partly folded around the side region of the body of the wearer.

Two straps 31a,b attached to each side of the upper end of the elongated central cover part 6 of the back section 4 are pulled
15 through the buckles 15a,b on the straps 14a,b on top of the upper side cover parts 7a,b for centralising the back section in relation to the body of the wearer.

This operation can be done easily and quickly by supplying the straps 31a,b with strips 32a,b of hook and pile fastening known
20 as VELCRO®.

Also the upper cover parts 16a,b of the front section 2 of the waistcoat are attached to the belt straps of the person's trousers (not shown) by means of the straps 22a,b with the
25 buckles 23a,b.

Now the waistcoat is carefully secured to the body of the wearer in such a way that the armour cover parts are partly overlapping the adjacent cover parts, thereby leaving no
30 opening for allowing a bullet or a knife or awl to find its way to the body of the wearer.

This advantageous construction is illustrated in Fig. 10 showing a fragment, seen in section, of the lower end of the
35 front section 2. The upper plate-formed cover part 16a,b of the front section 2 is, as can be seen, connected to the second lower plate-formed cover part 18 of the front region 2 with the

straps 21a,b leaving an opening 33 free between said parts. Said opening is, however, covered by the first lower plate-formed cover part 17.

5 Fig. 12 shows another embodiment of the invention as it can be applied to the front section 3 of the waistcoat. In Fig. 12, front section 3 includes one upper plate-formed armour cover part 16 and one lower plate-formed armour cover part 18 joined by connecting means 39, a zipper, for example. Upper cover
10 part 16 is overlapped with lower cover part 18. The edge 40 of upper cover part 16 shows the degree of overlap.

Connecting means 39 is joined to upper cover part 16 and lower cover part 18 in such a manner that the cover parts 16,18 can
15 move relative to each other with movement of the wearer of a waistcoat that includes this front section 3. The path of connecting means 39 and of the edges of the cover parts 16,18 can follow a diagonal down from the right or the left side, or can take the shape of an "S" (as in Fig. 12) or the shape of a
20 "Z", or can be a combination of horizontal and vertical runs in any way such that the cover parts 16,18 can move relative to each other.

Fig. 11 shows, on an enlarged scale and seen in section, a
25 detail of the two lower cover parts 17 and 18 illustrating how the armour cover parts more precisely are constructed.

Each armour cover part comprises a fabric covering in the form of an enclosure 34. In the enclosure is placed a first
30 protecting material 35, which is resistant against being penetrated by low calibre ballistic projectiles.

The first protecting material could be KEVLAR® aramid fiber, a material that is made by E. I. du Pont de Nemours and Company
35 and formed into thin layers of fabric that can be sewn together to obtain the necessary thickness.

Many bullet-resistant materials are, however, not sufficiently effective against being penetrated by a pointed object such as a knife or an awl. To overcome this problem there can be, between two layers of the first protecting material 35 in each enclosure, a second protecting material 36 which is resistant against penetration by a knife or an awl. The second protecting material 36 could typically be a plate of a hard plastic such as polycarbonate.

As it appears from the explanation above, the armour cover parts each correspond to a specific region of the body of the person wearing the waistcoat. Moreover, the straps connecting the armour cover parts are to a great extent arranged along the motor muscles and also have such an elasticity that each armour cover part follows the movement of the corresponding region of the body.

The waistcoat according to the invention therefore obtains the same pattern of movement as the body of the person wearing the waistcoat, thereby offering the person much more freedom of movement and much more comfort than is possible when using a protective waistcoat of conventional type.

More specifically, the upper armour cover parts 16a,b of the front section 2 covering the chest sit tightly to follow the body movement, while the lower armour cover parts 17 and 18 of the front section 2 slide over each other like tiles for no impediment to body movement or downward rotation of body.

The lowermost armour cover part 18 is fastened to the belt straps on the person's trousers (not shown) ensuring that it remains in position when moving away from a potential attacker forcing the person backwards.

The upper plate-formed side cover parts 7a,b of the back section 3 are constructed to slide, stretch from the connections, and fall back into place depending on how the body

moves, and the lower plate-formed cover parts 8a,b overlaps the abdominal region.

5 The waistcoat according to the invention provides the wearer with a great mobility. The waistcoat enables the wearer to sit, to get in and out of a vehicle, without the protective parts of the waistcoat being moved out of a protective position. The waistcoat fits tightly over the human body and will, due to its structure, always adapt to the different
10 movements of the person. A person raising his arms to a shooting position will still be protected as the cover parts during the movement of the arms slide over each other. The known rigid protective waistcoats are raised together with the arms thereby providing an unpractical and cumbersome shooting
15 position, in addition to exposing a part of the wearer's body.

The embodiments described above and shown in the figures are only to be understood as examples of the invention. Within the scope of the invention there can be many other embodiments. As
20 an example can be mentioned that the waistcoat can be made with the front according to the invention and a traditional back.

The front section of the waistcoat can, by way of example, be formed like the back section with an elongated central cover part and plate-formed side cover parts attached to the central
25 cover part.

Furthermore, each of the cover parts can be removed and washed individually, if they were to get soiled.

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The foregoing description of the present invention has been presented for the purpose of illustration and description. The description is not intended to limit the invention to the form disclosed herein. Consequently, variations and modifications
35 commensurate with the above teaching and the skill or knowledge of the relevant art are within the scope of the invention. The embodiments described herein are further intended to explain

best modes known for practising the invention. It is intended that the appended claims be construed to include alternative embodiments to the extent by the prior art.

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Claims:

1. A protective waistcoat comprising a front section and a back section and connecting means for connecting the two sections characterised in that the front section comprises at least one upper plate-formed armour cover part for substantially covering the chest region of a person wearing the waistcoat, at least one lower plate-formed armour cover part for substantially covering the abdominal region of the person, and that at least some of said armour cover parts are arranged in partly overlapping relationship to each other so as to allow said parts to slide over each other.
2. A protective waistcoat according to Claim 1, characterised in that the at least one upper plate-formed armour cover part for substantially covering the chest region of a person wearing the waistcoat comprises, at least one upper plate-formed right hand armour cover part for substantially covering the right-hand chest region of a person wearing the waistcoat, and at least one upper plate-formed left hand armour cover part for substantially covering the left-hand chest region of the person.
3. A protective waistcoat according to Claim 1 or 2, characterised in that the right hand and left hand upper armour cover parts are arranged in partly overlapping relationship to each other.
4. A protective waistcoat according to Claim 1 or 2, characterised in that the back section comprises at least one armour cover part arranged in partly overlapping relationship to the at least one lower plate-formed armour cover part of the front section when the waistcoat is positioned on a person.

5. A protective waistcoat according to Claim 1, characterised in that the back section comprises an elongated central armour cover part extending along the spinal column of a person wearing the waistcoat, and at least two plate-formed side armour cover parts attached on each side of the central armour cover part in partly overlapping relationship.
6. A protective waistcoat according to Claim 5, characterised in that the central armour cover part comprises at least two webs extending in opposite directions and connecting the at least two plate-formed side armour cover parts on each side of the central armour cover part, and at least two armour cover webs extending in opposite directions and partly overlapping the at least two plate-formed side armour cover parts connected to the respective connection web.
7. A protective waistcoat according to Claim 5 or 6, characterised in that the central armour cover part comprises two armour cover webs on each side of the central armour cover part, and two connection webs on each side of the central armour cover part arranged between the two armour cover webs placed on the same side of the central armour cover part as the respective connection webs.
8. A protective waistcoat according to Claim 5 or 6, characterised in that there is arranged an upper plate-formed side armour cover part on each side of the central armour cover part for substantially covering the scapula region of a person wearing the waistcoat; and there is arranged a lower plate-formed side armour cover part on each side of the

central amour cover part for substantially covering the lower region of the back of the person.

- 5 9. A protective waistcoat according to Claim 1, 2, 5, or 6 characterised in that each armour cover part comprises a fabric lining forming an enclosure, and a first protecting material, that is held in said enclosure and is ballistic resistant.
- 10 10. A protective waistcoat according to Claim 9, characterised in that the first protecting material in the enclosure comprises a plurality of layers sewn together.
- 15 11. A protective waistcoat according to Claim 10, characterised in that, between layers of the first protecting material in the enclosure, there is placed at least one second protecting material that is resistant to penetration by a knife or an awl.
- 20 12. A protective waistcoat according to Claim 5 or 6, characterised in that the connecting means for connecting the front section and the back section of the waistcoat comprise a first set of straps
- 25 extending over the shoulders of a person wearing the waistcoat and connecting the upper plate-formed side armour cover parts for substantially covering the scapula region of the person with the at least one upper plate-formed armour cover part for
- 30 substantially covering the chest region of the person.
- 35 13. A protective waistcoat according to Claim 12, characterised in that the first set of straps is connected to the upper end of the elongated central armour cover part extending along the spinal column of a person wearing the waistcoat by means of a

5 second set of straps, and the lower end of the central armour cover part is connected with the at least one upper plate-formed armour cover part for substantially covering the chest region of the person by means of a third set of straps.

14. A protective waistcoat according to Claim 13, characterised in that at least some of the straps are made of an elastic material.

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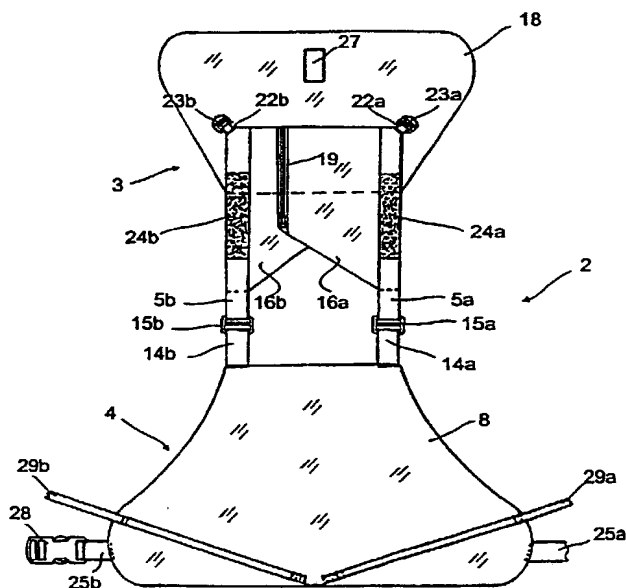
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- With amended claims and statement.

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROTECTIVE WAISTCOAT



(57) Abstract: A protective waistcoat comprising a front section (3) on the front side of a person (1) wearing the waistcoat (2) and a back section (4) on the back side of said person, straps (5a, b; 14a, b; 20a, b; 21a, b; 25a, b; 29a, b, 31a, b) for connecting the two sections (2; 3), and a number of armour cover parts (6; 7a, b; 8a, b; 16a, b; 17; 18) forming the sections. The armour cover parts (16a, b; 17; 18) of the front section (3) furthermore comprises at least one upper plate-formed armour covert part (16a, b) for substantially covering the chest region of a person wearing the waistcoat and at least one lower plate-formed armour cover part (17; 18) for substantially covering the abdominal region of the person, and said armour cover parts are arranged in partly overlapping relationship to each other. The waistcoat according to the invention thereby offers the wearer much more freedom of movement and much more comfort than was available when using a protective waistcoat of conventional type.



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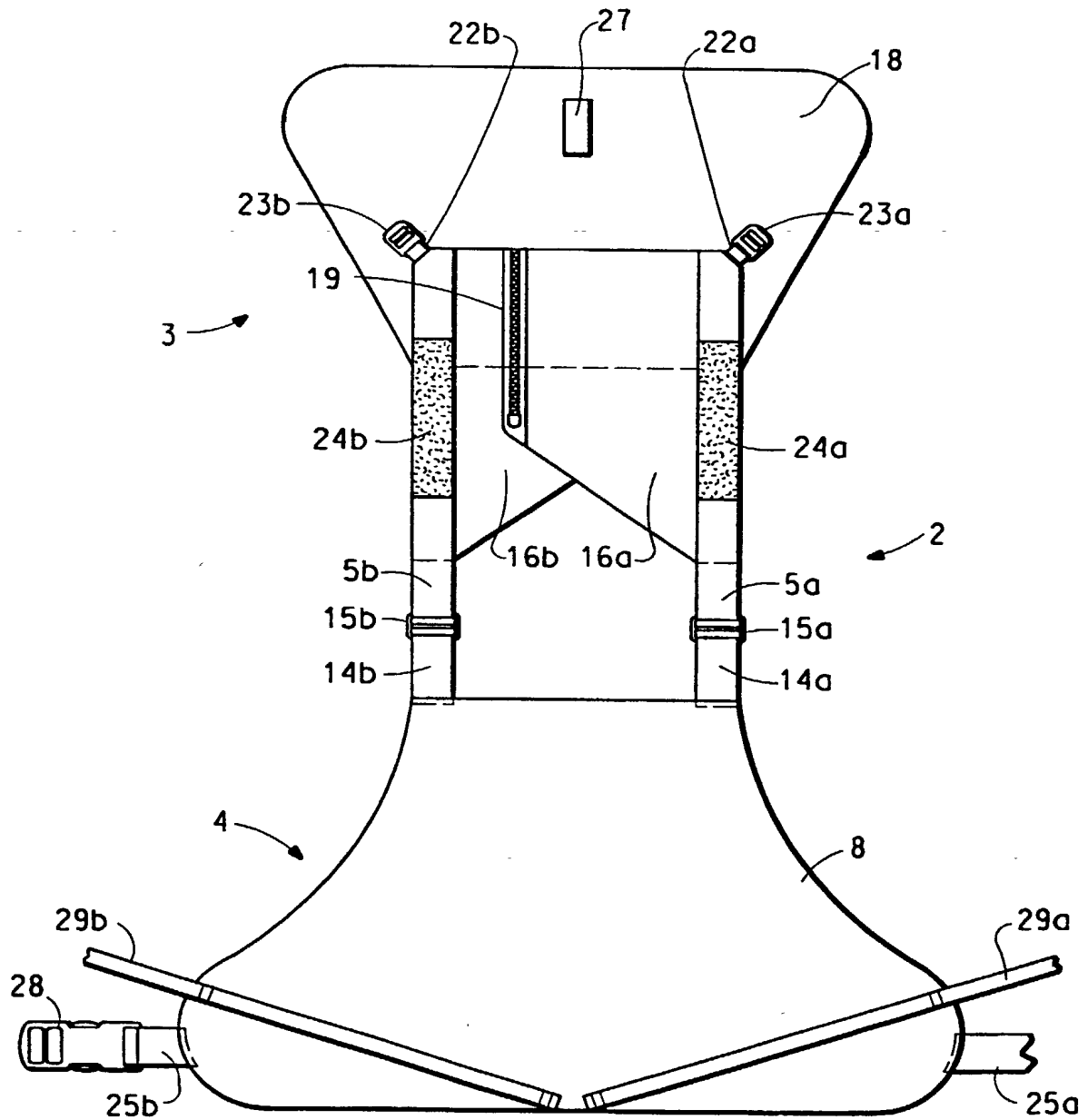


FIG. 1

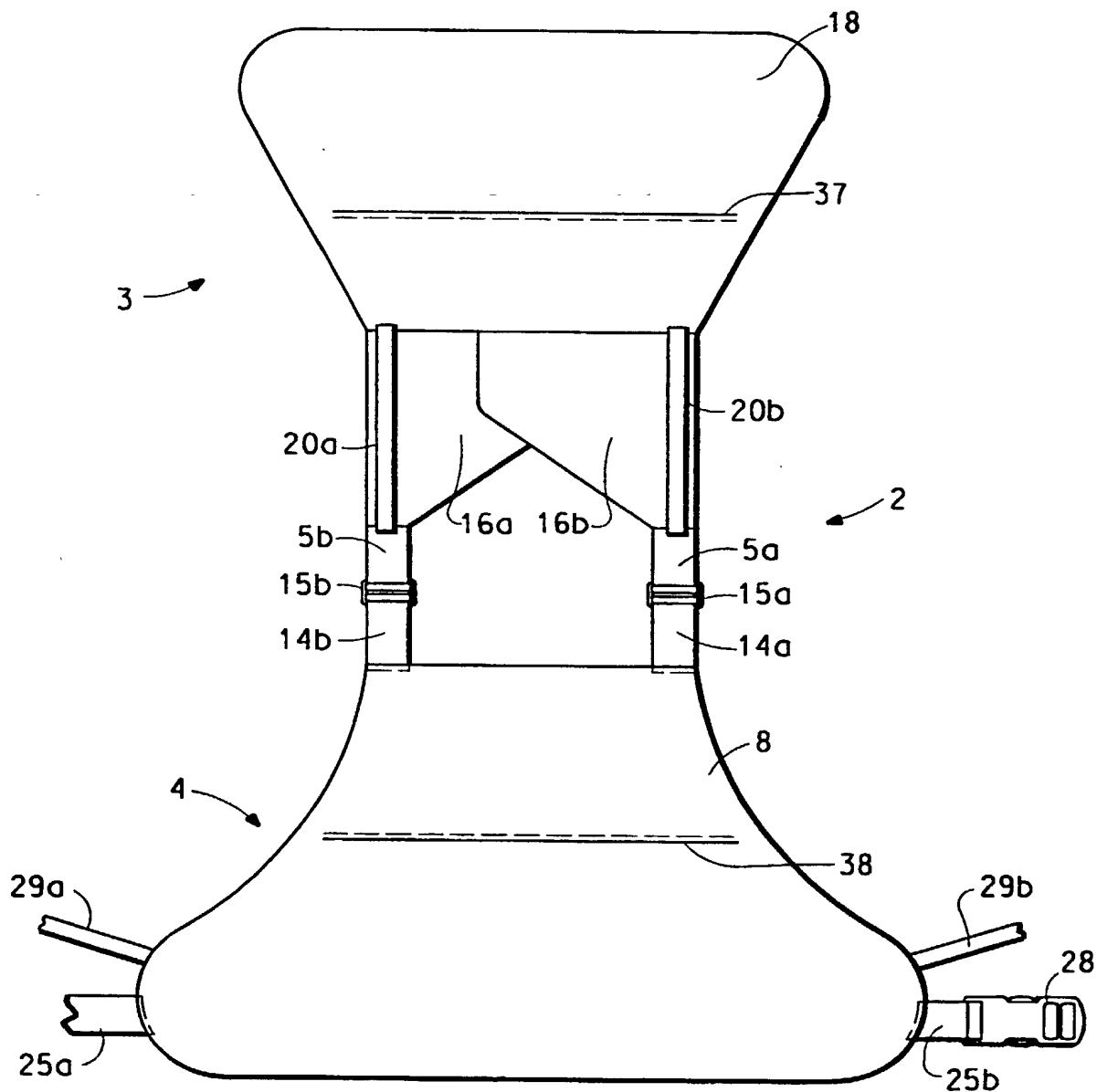


FIG. 2

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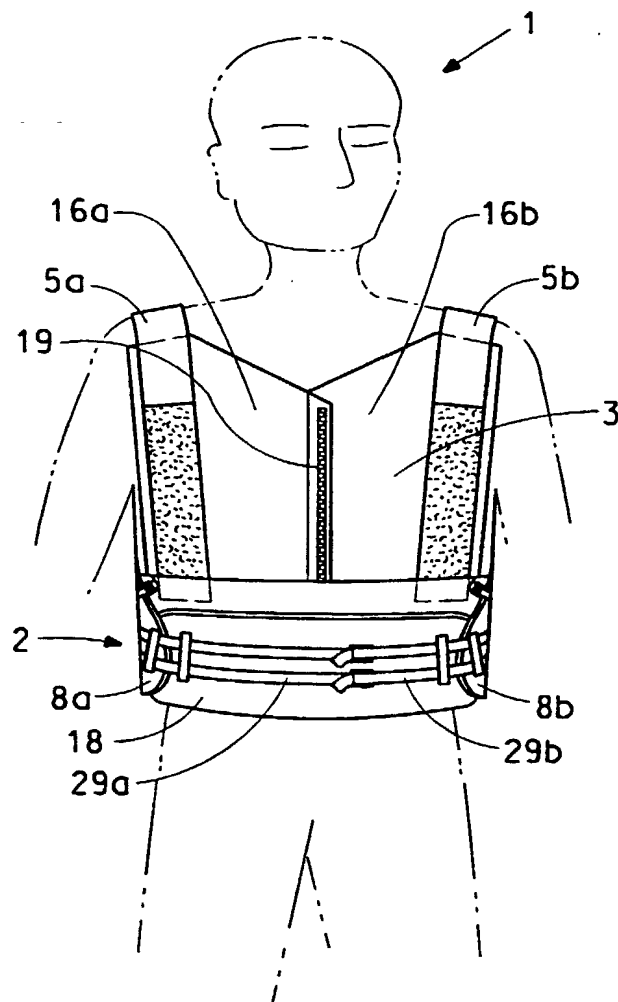


FIG. 3

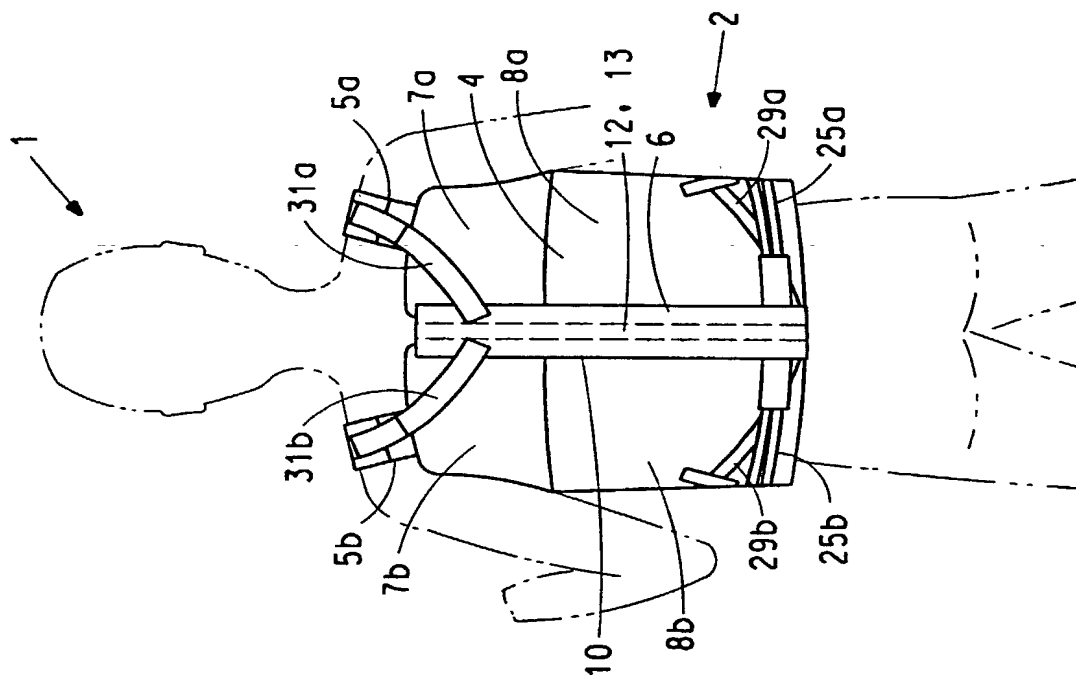


FIG. 5

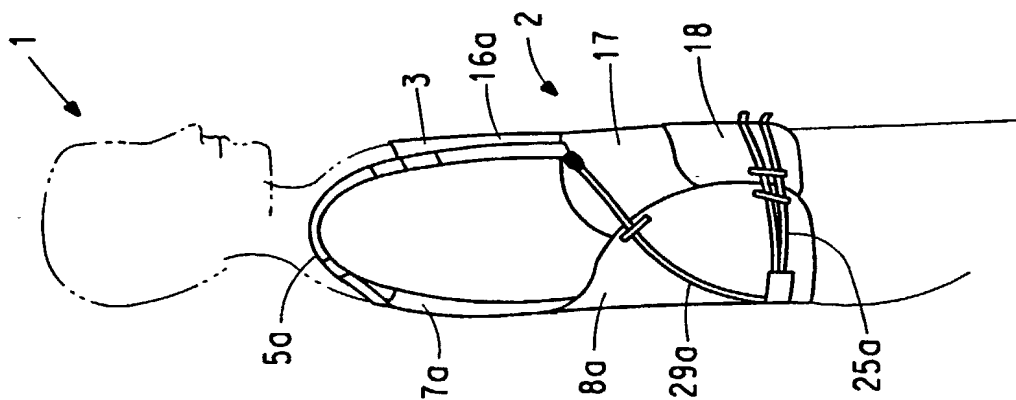


FIG. 4

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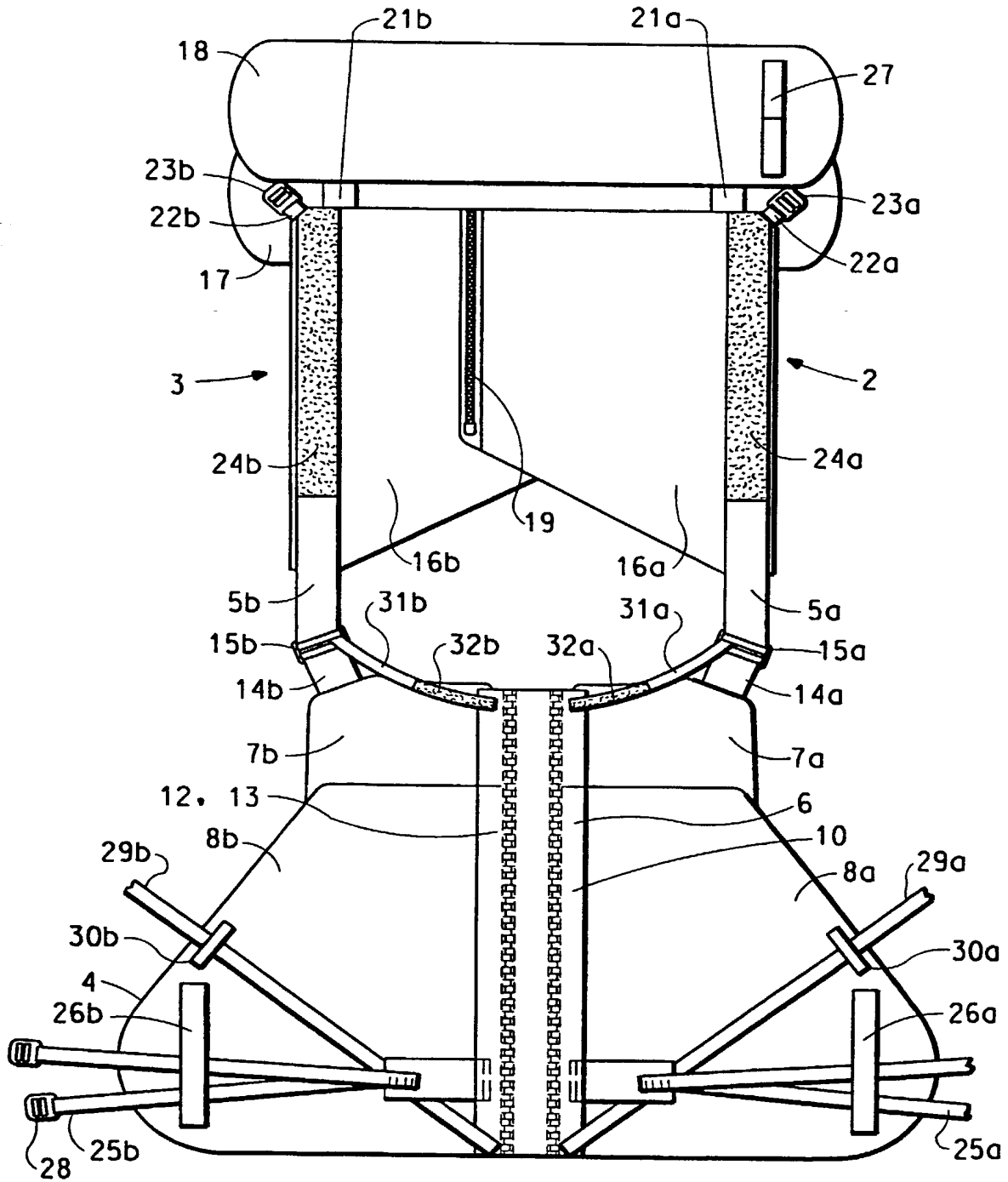


FIG. 6

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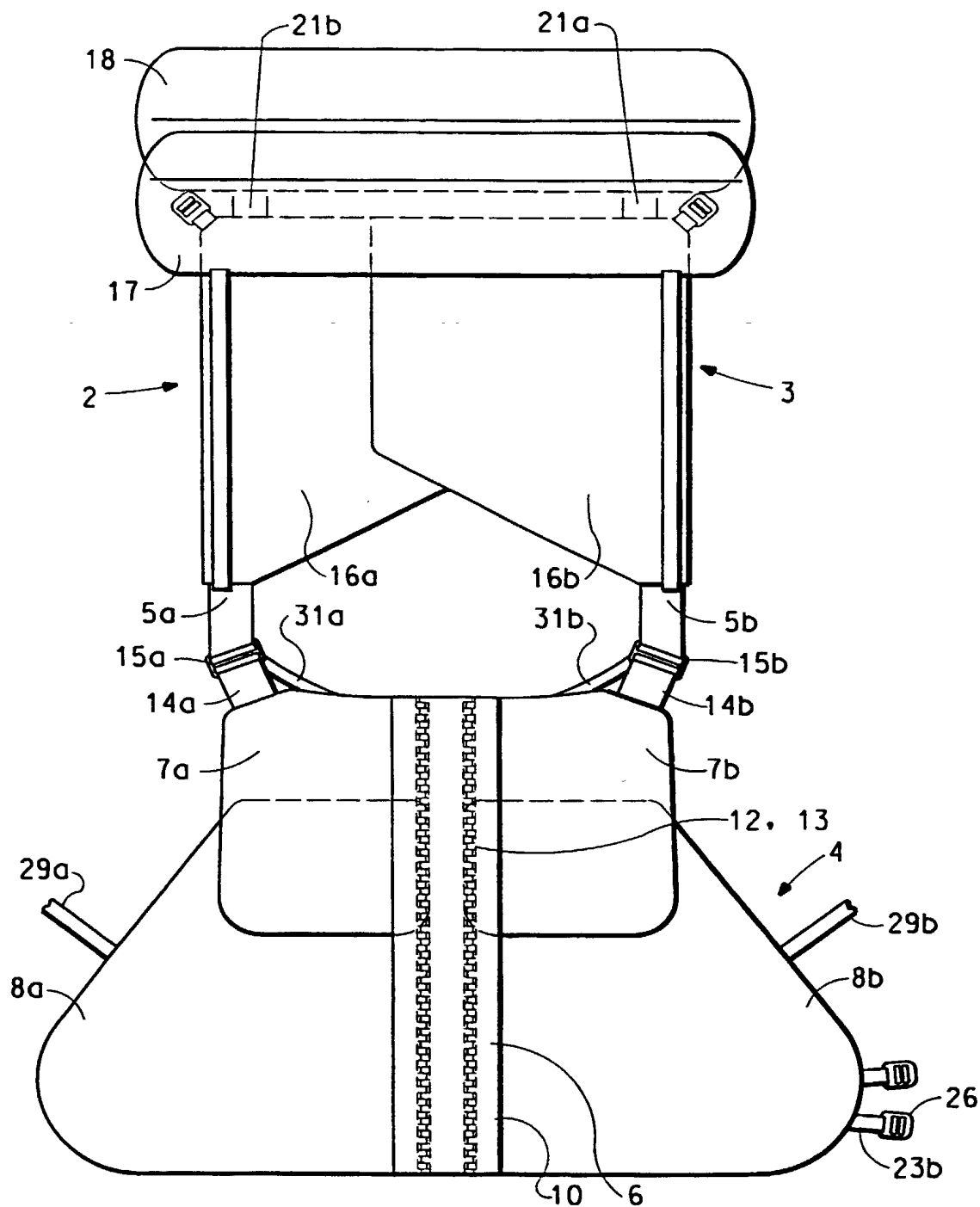


FIG. 7

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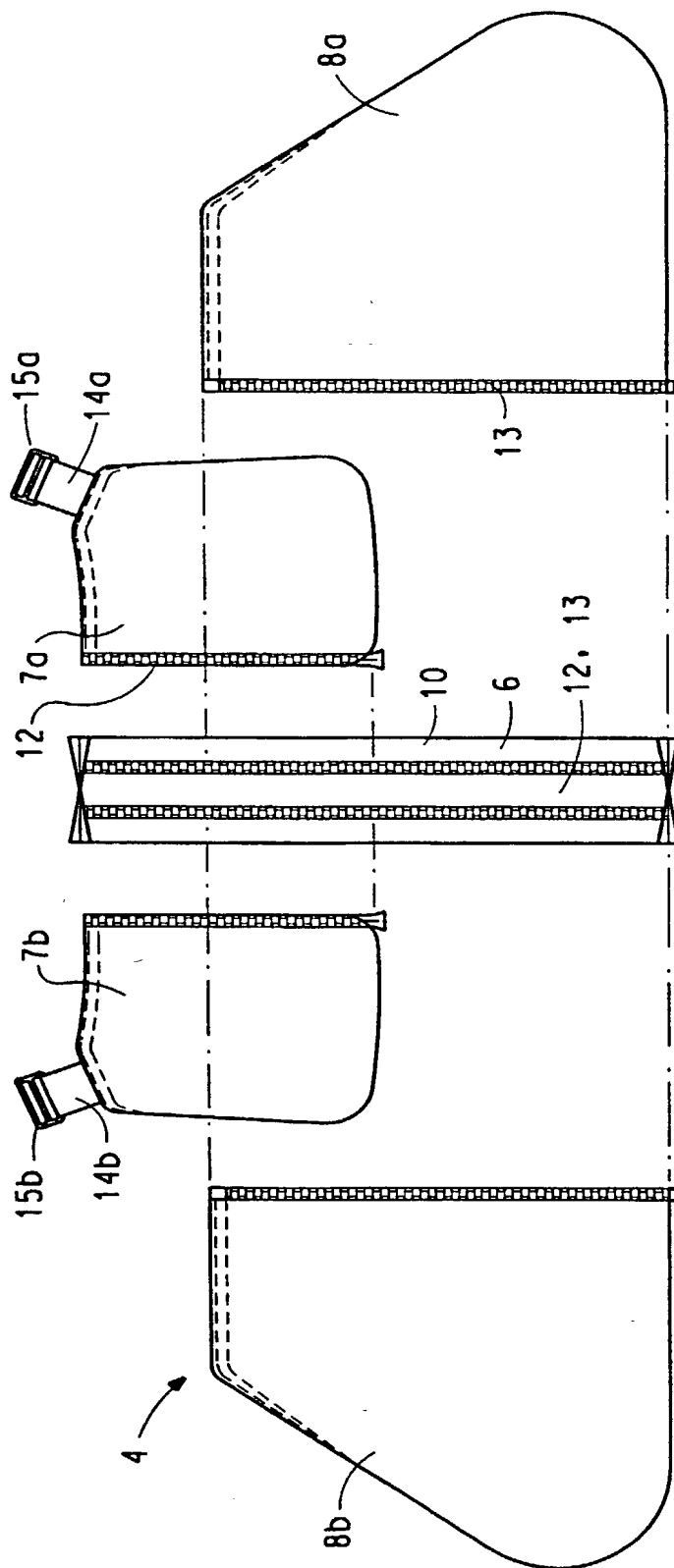


FIG. 8

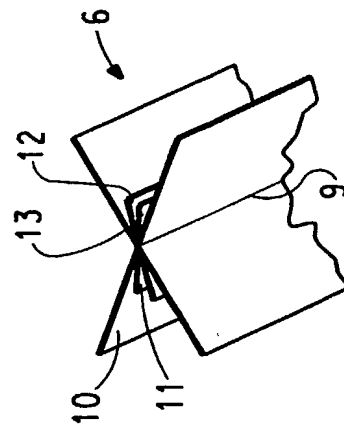


FIG. 9

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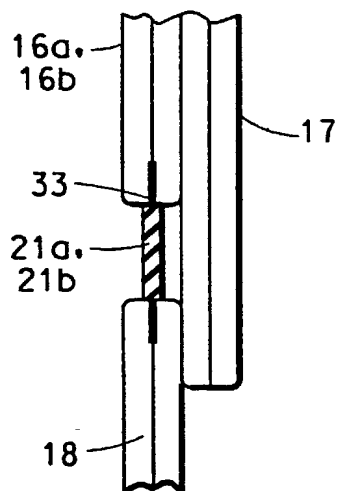


FIG. 10

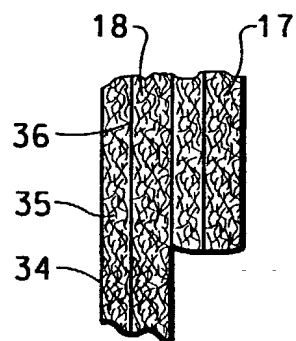


FIG. 11

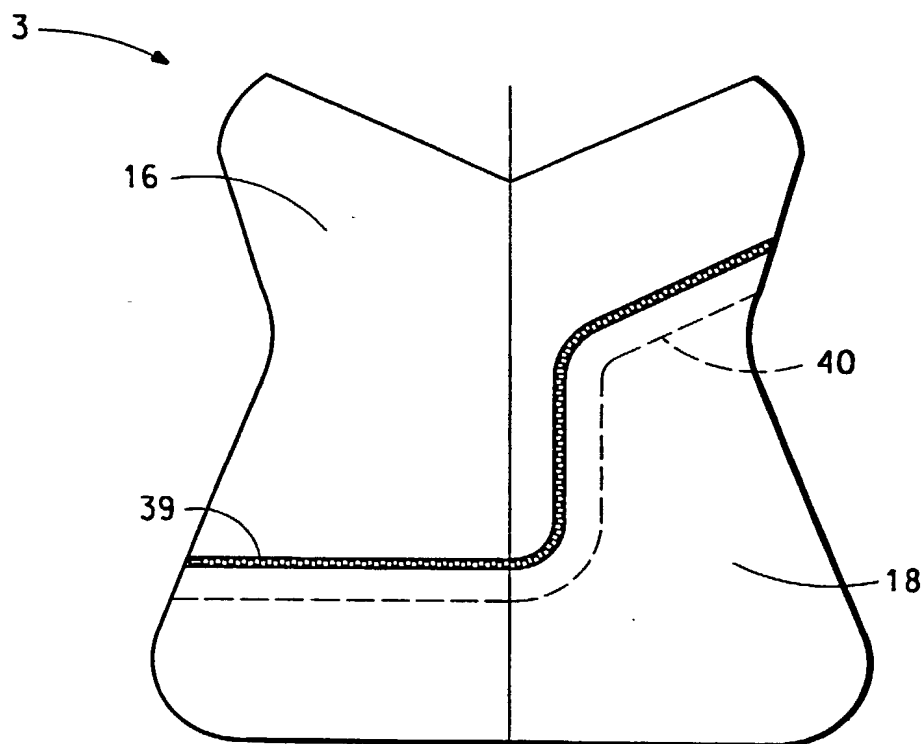


FIG. 12

POWER OF ATTORNEY

I, the undersigned, Kwame Dako, am inventor and applicant in Danish Patent Applications 1999DK-00990, filed 8 July 1999, 2000DK-00238, filed 15 February 2000, and 2000DK-00710, filed 1 May 2000, and I hereby grant authority to ROBERT J. SHAFER and P. MICHAEL WALKER to act on my behalf before the competent international and national authorities in connection with any and all patent applications corresponding to the aforesaid Danish Patent Applications in any country. The named attorneys shall have authority to prosecute those applications, to make alterations and amendments therein, to inspect the files, to appoint substitute and associate powers of attorney, and to transact all business in the various patent and trademark offices connected therewith.

The authority hereby granted shall be effective as of 7 July 2000 and shall continue until prosecution has been completed on all patent applications corresponding to the aforesaid Danish Patent Applications.

By: Kwame Dako
Kwame Dako

Date: 10/08/2000

Rev. 06/95

Docket Number
KB-4400**DECLARATION and POWER OF ATTORNEY**

As a below-named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PROTECTIVE WAISTCOAT

the specification of which is attached hereto unless the following box is checked:

☒ was filed on JULY 7, 2000 as U.S. Application No. _____ or PCT International Application No. PCT/US00/18588 and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is known to me to be material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed.

Application No.	Country	Filing Date	Priority Claimed (Yes/No)
PA 1999 00990 ✓	DK ✓	07/08/99 ✓	Yes
PA 2000 00238 ✓	DK ✓	02/15/00 ✓	Yes
PA 2000 00710 ✓	DK ✓	05/01/00 ✓	Yes

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States Provisional Application(s) listed below.

U.S. Provisional Application No.

U.S. Filing Date

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International Application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application or PCT International Application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is known to me to be material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Application No.

Filing Date

Status (patented, pending or abandoned)

POWER OF ATTORNEY: I hereby appoint the following attorney(s) and/or agent(s) the power to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:Name: JOHN E. GRIFFITHSRegistration No. 32,647

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

INVENTOR(S)

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☐ Additional Inventors are being named on separately numbered sheets attached hereto.

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GENERAL POWER OF ATTORNEY
(Concerning Several International Patent Applications)

The undersigned, Vernon R. Rice, Vice President and Assistant General Counsel of E. I. DU PONT DE NEMOURS AND COMPANY, 1007 Market Street, Wilmington, Delaware 19898 USA ("DuPont"), hereby confirms that the power to sign for DuPont has been granted to various individuals (as set forth in the attached excerpt from DuPont's Patent Board Rules of Procedure (January 1988), Appendix Section III.A.4), including the Chairman, Vice-Chairman, and those individuals who are Assistant Secretaries of the Patent Board. Currently these Assistant Secretaries are:

Roger A. Bowman
Linda J. Davis
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In addition, the authority to act on behalf of DuPont before the competent International Authorities in connection with any and all international patent applications filed by it with the United States as Receiving Office and to make or receive payments on its behalf is hereby granted to:

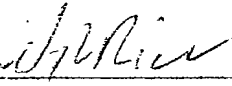
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Beardell, Lori Y.	<u>34,293</u>	Katz, Elliott A.	<u>26,396</u>
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Joung, J. Kenneth	<u>41,881</u>	Wang, Chen	<u>38,650</u>

The undersigned ratifies fully all actions already taken by the above-named individuals in accordance with the authority granted hereby.

E. I. DU PONT DE NEMOURS AND COMPANY

By:


Vernon R. Rice
Vice President and Assistant General Counsel

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